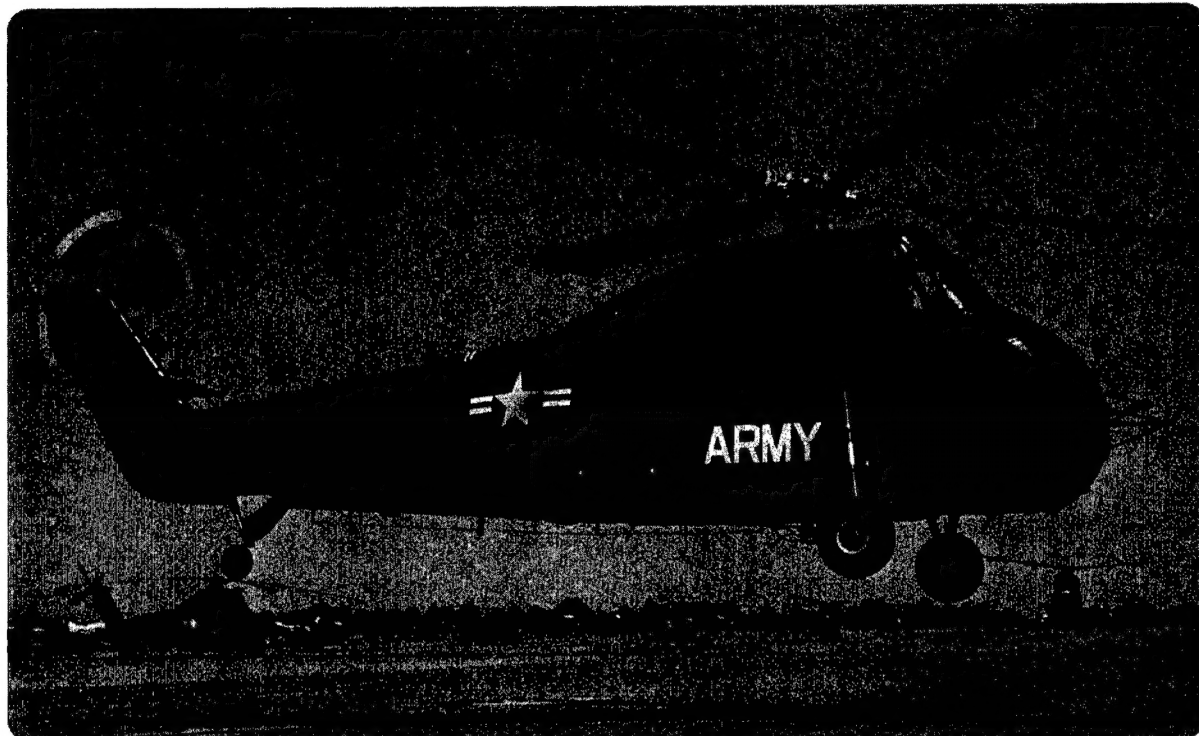


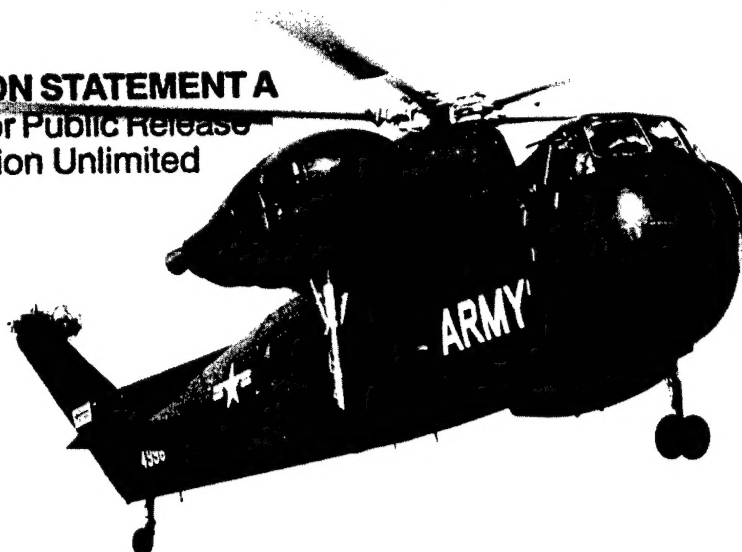
MAJORS, INCIDENTS, FORCED AND PRECAUTIONARY LANDINGS • 1 JULY 66 THROUGH 30 JUNE 67



CH-34 and CH-37 accident summary

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CH-34 and CH-37 Aircraft Accident Summary

1 JULY 1966 THROUGH 30 JUNE 1967

INTRODUCTION

This summary was prepared to help commanders at all levels, aviation safety officers, maintenance officers, aviators, and related aviation personnel to prevent future accidents and preserve combat resources through a review of past CH-34 and CH-37 mishaps and their cause factors. The term *mishap*, as used in this summary, includes accidents, incidents, forced landings, and precautionary landings, as defined by paragraph 7, AR 385-40. Information presented in this summary was taken from accident and other mishap reports submitted from all Army commands during FY 1967, as required by section IV, AR 385-40. Aircraft losses or damages which were the direct result of hostile action in RVN are not included. Each mishap brief is preceded by a USABAAR log number so that queries may be directed to USABAAR if additional information is desired. Information on Modification Work Orders (MWOs) was extracted from Department of the Army Pamphlet No. 310-7, *U.S. Army Equipment Index of Modification Work Orders*, April 1968. Technical Bulletin (TB) information was furnished by USA-AVSCOM.

CAUSE FACTORS

The majority of the FY 1967 briefs presented in this summary were selected as representative samples of the most frequently recurring types and their cause factors. Cause factors include crew error, inadequate and improper maintenance, inadequate unit training, inadequate supervision, weather, and materiel failure and malfunction.

Cause factors for many incidents, forced landings, and precautionary landings were reported as suspected. Cause factors for many of these lesser mishaps were not reported, nor was supplemental information received. For an effective safety program, specific cause factors must be known. Insufficient information or lack of supplemental information about known specific cause factors results in wasted effort, time, and resources.

The chance to gain prevention information from

forced and precautionary landings is much greater than that for other type mishaps, because the crews involved in these were able to cope successfully with in-flight emergencies and land without damage. If the full circumstances that brought about these emergencies and the techniques used to cope with them could be shared and learned by all, Army aviators would be in a far better position to prevent accidents resulting from similar cause factors. Unfortunately, these mishaps rarely generate the investigation interest given to accidents involving major or minor damage.

CONCLUSIONS

A concerted effort on the part of commanders and supervisors at all levels is needed to achieve a more effective safety program. This can best be accomplished through:

Knowledge of past mishap experience and cause factors, available through aircraft accident summaries such as this, weekly and monthly mishap summaries, and the Crash Sense Department of the U.S. ARMY AVIATION DIGEST. Distribution of weekly and monthly mishap summaries may be obtained by writing to: Director, USABAAR, ATTN: P&G, Fort Rucker, Alabama 36360. Distribution of the U.S. ARMY AVIATION DIGEST may be obtained by submitting DA Form 12-4 in accordance with instructions on the back of the form.

Prevention surveys conducted on a revolving basis to isolate potential hazards in facilities, equipment, and personnel. Copies of the *Aircraft Accident Prevention Survey* prepared by USABAAR may be obtained by writing to: Director, USABAAR, ATTN: P&G, Fort Rucker, Alabama 36360.

Effective prevention planning, as outlined in part 1, AR 95-5.

Implementation of unit safety programs, as outlined in appendix VI, AR 95-5.

Increased command emphasis on investigation and reporting of incidents, forced landings, and precautionary landings, to include all information required by paragraph 23e, AR 385-40.

CH-34 SECTION

Table 1 shows total CH-34 mishaps for FY 1965 through FY 1967. Major accidents decreased by 1 (25%) in FY 1967, and there were no minor accidents. Incidents, forced landings, and precautionary landings accounted for 62 (95%) of the total mishaps in FY 1967. Total flying hours, as indicated in Table 2, decreased by 11,205 (25%), but the accident rate (8.7) remained the same as that for FY 1966. Mishap costs decreased from \$1,240,725 in FY 1966 to \$416,716 (66%) in FY 1967. Table 3 shows that there were eight occupants aboard during the three survivable accidents in FY 1967 with two sustaining nonfatal injuries.

Selected Major Accident Briefs

F542—Accident occurred during ground runup phase of a maintenance test flight to check out replacement of a left lateral primary servo. Preflight was accomplished with no discrepancies noted. Engine was started and warmup was normal. Rotor was engaged, but two attempts were required to complete engagement. RPM was established at 1700-1800 and maintained to allow clutch to drain, then a flight control check was made. The cyclic was moved fore and aft and during forward movement, the collective pitch moved upward about 3 inches. Primary servo was turned off and cyclic was moved about again, but no difficulty was encountered. Servo selector switch was moved from "primary off" to "both" to "auxiliary servo off." When the auxiliary servo was switched "off," the collective pitch began to rise. Pilot was unable to push the collective down, and attempted to close throttle to reduce rpm while applying down pressure on the collective. Aircraft became light on its main

TABLE 1
Total CH-34 Mishaps

FY	MAJ	MIN	INCD	F/L	P/L	TOTAL
1965	10	0	9	20	31	70
1966	4	0	13	13	31	61
1967	3	0	9	12	41	65
TOTAL	17	0	31	45	103	196

TABLE 2
CH-34 Accident Rates Per 100,000 Flying Hours

FY	NO. OF ACDTS	HR. FLOWN	RATE
1965	10	62,230	16.1
1966	4	45,761	8.7
1967	3	34,556	8.7
TOTAL	17	142,547	11.9

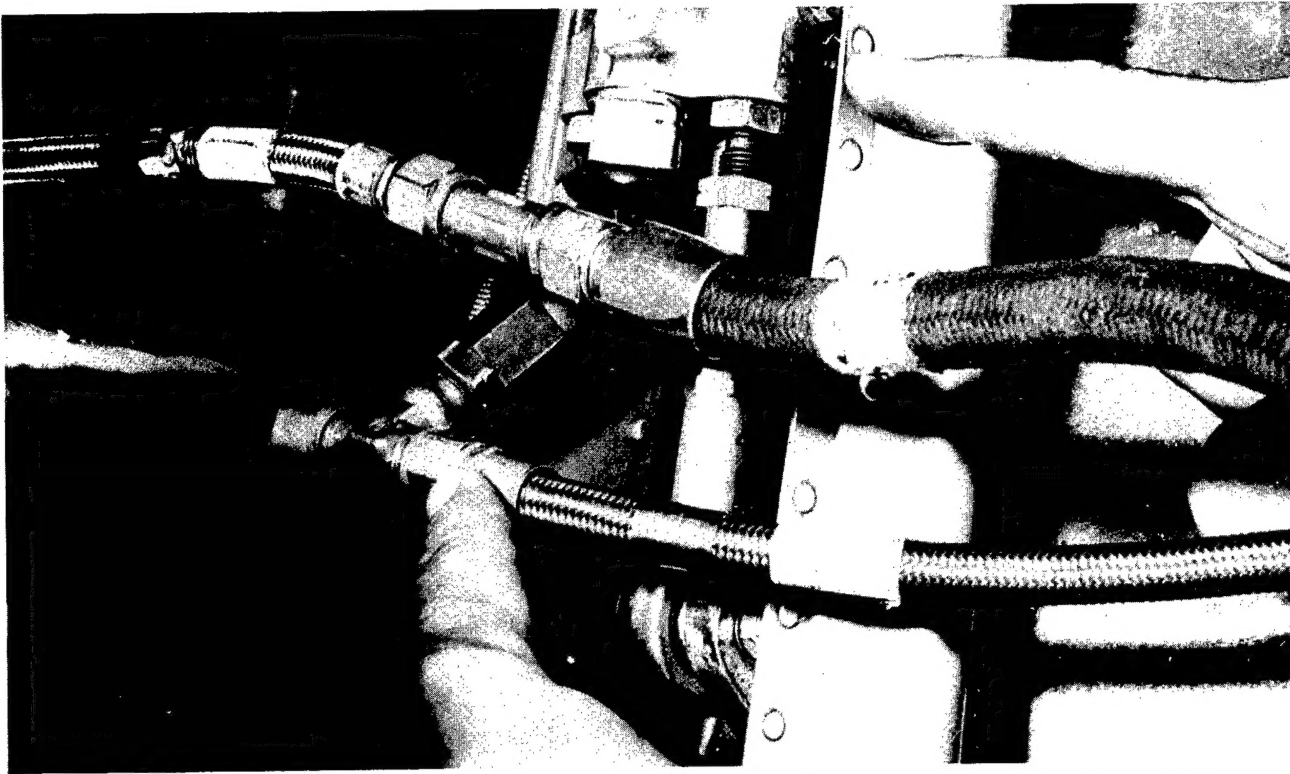
TABLE 3
CH-34 Occupant Injuries

FY	Acdds		Occupants				
			Injury Classification			Total on Board	
	S	NS	Fatal	Nonfatal	None	Survivable Accidents	Non-survivable Accidents
1965	10	0	2	10	57	69	0
1966	3	1	3	5	9	14	3
1967	3	0	0	2	6	8	0
Total	16	1	5	17	72	91	3

S-Survivable
NS-Non survivable

landing gear, moved slightly rearward and left, and rolled over on left side, damaging tail rotor, tail pylon, main rotor blades and head, and three bell-crank assemblies. Pilot had minor injuries. Caused by improper installation of primary servo system pressure and return hydraulic lines. The low pressure hydraulic return line from the hydraulic reservoir was attached to the high pressure port of the left lateral servo, while the high pressure line was attached to the low pressure port of the left lateral servo. Other causes were (1) local maintenance supervisor did not adequately supervise or properly check completed installation of the left lateral primary servo, including pressure and return lines, (2) technical inspector failed to detect the incorrect installation and accepted installation, (3) neither the crewchief nor the maintenance test pilot detected the incorrect installation during preflight, and (4) use of improper technique in overcoming malfunction.

021401—Engine was started and rpm stabilized at 900-1000. The a.c. inverter switch was turned on and the artificial horizon indicator was caged. Engine rpm increased to 3000, and pilot turned off



F542 Collective could not be lowered due to improperly installed primary servo system pressure and return hydraulic lines.

magneto switch and fuel mixture and closed throttle. None of these actions affected engine operation. The centrifugal force created by high engine rpm (3500) threw the engine cooling fan blades off the hub. Blades struck main rotor blades and severed the control linkages to the carburetor, rupturing main fuel line to the engine compartment. Boost pump and main fuel valve were not turned off and raw fuel flowed from ruptured line. Fire destroyed aircraft. Pilot had minor injuries. Caused by (1) failure to apply adequate throttle friction during starting procedures, (2) inadequate checklists which did not include positive guidance in applying throttle friction during starting procedures, and (3) inadequate training in operational procedures.

052202—Approach was set up and aircraft was brought to hover about 60 feet from landing site. Site, on an uphill slope dropping into an 80-foot ravine, was unsuitable. Tail pylon appeared to extend over ravine. RPM was lost when aircraft was maneuvered to more suitable landing site, and right pedal turn was made to take advantage of remaining power. Aircraft made a sliding turn while descending into ravine and hit opposite bank of ravine, damaging left main wheel, tail wheel, and yoke. Caused by (1) operating aircraft without sufficient margin of power, (2) failing to make a power check prior to operation, (3) conducting reconnaissance too high to provide detailed knowledge of landing area, and (4) failure to consider possible emergency procedures before operation.

Selected Incident Briefs

G123—Cooling fan threw one blade during shutdown, damaging fan, clutch cable, stator, and canted bulkhead. Caused by blade failure.

G150—Front lower clamp on pilot's window broke loose. Wind forced front part of window out and back. Window broke in half diagonally and passed through main rotor, damaging main rotor blade and window.

G868—Main rotor blades struck trees in confined area, damaging three main rotor blades and one tip cap.

H497—Aircraft went into ground resonance while IP was demonstrating maximum performance takeoff, damaging main rotor dampers.

H600—Pilot taxied too close to parked CH-34 while parking. Incident damage to main rotor blade tip cap of taxiing aircraft and tail rotor of parked aircraft.

H665—Lower front corner of pilot's window came out and window was broken in half from lower left to upper right. Lower portion hit right service platform, causing 4-inch crack. Upper portion remained locked in aircraft. MWO 55-1520-202-34/27 had not been complied with. Kits had not been received.

011503—Main rotor blades hit 3-inch aluminum pole while aircraft was taxiing to refueling pump, damaging four tip caps. Pilot was watching crew-chief who was acting as ground guide and did not see pole.

030203—Teardrop cover screw came loose, hit tail rotor blade, and was thrown into tail rotor pylon, damaging tail rotor blade, two structural formers, and tail rotor pylon skin.

052907—Main rotor blade hit tree in confined area, damaging tip cap.

061205—Pilot's window separated and fell from aircraft after takeoff. Caused by broken lower window rail.

Selected Forced Landing Briefs

F817—Engine backfired, lost rpm, and emitted smoke at 10 feet during steep landing approach. Chip detector warning light came on. Aircraft was autorotated. Suspect failure of No. 5 cylinder.

022310—Engine failed and aircraft was autorotated. Suspect magneto failure.

031702—Smoke filled cabin when aircraft was in level flight at 1,000 feet. Caused by broken oil line (oil drain tube assembly, No. 1 cylinder), allowing engine oil to spray on exhaust collector ring.

041701—A descending right turn was established to final approach. Power was increased, but with no response from engine. Aircraft was autorotated to heliport in midst of a built-up area, broke two telephone wires with tail wheel during flare, but landed with no damage. Throttle control torque tube was found hanging loose from support assembly and bolt was found on bulkhead floor.

042008—Engine failed when aircraft was on short final, approximately 150 meters from pinnacle helipad at 4,232 feet. Aircraft was autorotated, left turn was made into a valley, and aircraft descended to 1,400 feet and landed in a small clearing in wooded area, just short of cliff. Large metal particles found on magnetic plug.

Selected Precautionary Landing Briefs

F551—Engine rpm surged and fell below rotor rpm. Caused by fuel contamination.

F775—Engine backfired and rpm dropped. Aircraft was landed with power. Two spark plugs

found installed with two washers each.

F913—Fire warning light came on. Caused by short in wiring in warning system.

F966—Pilot of another aircraft in formation saw oil coming from transmission deck. Caused by deteriorated gasket in coupling assembly.

G106—Auxiliary servo pressure dropped to zero during takeoff. Caused by rupture in auxiliary hydraulic pump output line 9½ inches from quick disconnect end.

G116—Engine ran rough. Caused by fouled plugs.

G482—Pilot smelled fuel. Caused by loose vent line to forward fuel cell.

G702—Cylinder head temperature dropped below 50° C. Engine ran rough and manifold pressure increased 6 inches. Caused by failure of No. 7 cylinder.

H477—Pilot heard loud noise and landed. Caused by aft spark plug, No. 6 cylinder, vibrating loose.

H608—Instruments fluctuated and ASE would not disengage. Caused by failure of voltage regulator and generator.

022302—Transmission oil seeped into passenger compartment. Transmission breather iced over, causing transmission oil to blow out filler neck. Weather (blowing snow and -12° C temperature) considered factor.

032402—Engine oil chip detector warning light came on at 100 feet during takeoff. Two metal particles found on rear sump plug. Suspect failure of piston ring.

050212—Fuel warning light flickered on and off, and fuel pressure rose. Generator warning light came on and primary servo gauge dropped to zero. Smoke was detected on touchdown. Caused by failure of rear generator bearing.

051703—Smoke filled cockpit. Suspect defective heater.

052301—Pilot felt flutter in pedals and landed. Terminal on a.c.-d.c. relay interlock found broken off. Electrical lead was loose. Aircraft was just out of periodic inspection. Suspect terminal was accidentally broken during inspection.

053103—Engine oil temperature fluctuated. Caused by chafed wire in engine compartment.

062202—Pilot reported high frequency vibration. Suspect engine fan was out of balance.

CH-37 SECTION

Table 1 shows total CH-37 mishaps for FY 1965 through FY 1967. There were two major and no minor accidents during FY 1967. Incidents, forced landings, and precautionary landings accounted for 34 (94%) of the 36 mishaps during FY 1967. Total flying hours, as indicated in Table 2, decreased by 1,631 (17%) during FY 1967, but the accident rate was up 15.2 (143%). Cost of mishaps, up \$1,828,100, was about 120 times greater than that for the previous year (see Table 3). This increase is attributed to total loss of the aircraft involved in FY 1967 major accidents. Table 4 shows that there were eight occupants aboard during the one survivable accident in FY 1967 with three sustaining nonfatal injuries. All three occupants aboard the one non-survivable accident were killed.

Selected Major Accident Briefs

H798—Two CH-37Bs were flying at about 600 feet en route to destination. After 2½ hours, the lead aircraft began descending and turning left from 210° to 150° at a rate consistent with a normal landing approach. Rate of descent increased greatly at about 100 feet, and rotor assembly and transmission seemed to separate from aircraft about 15 feet above the ground. Aircraft, which was in a nose low attitude, was consumed in a ball of fire on or just prior to impact and was destroyed. Pilot, copilot, and crewchief killed. Caused by (1) fatigue failure of rotor head spindle through the aft pin hole, occurring from low overstress fatigue mechanism induced by high residual tensile stresses around outside hole periphery, and (2) lack of quality control.

020903—A high reconnaissance was made of landing site, and a turn to final approach was made to a heading of 240°. On short final, aircraft descended below the desired approach angle, and the twist grip

TABLE 1
Total CH-37 Mishaps

FY	MAJ	MIN	INCD	F/L	P/L	TOTAL
1965	4	0	9	10	32	55
1966	1	0	7	8	20	36
1967	2	0	5	4	25	36
TOTAL	7	0	21	22	77	127

TABLE 2
CH-37 Accident Rates Per 100,000 Flying Hours

FY	NO. OF ACDTs	HR. FLOWN	RATE
1965	4	13,934	28.7
1966	1	9,388	10.6
1967	2	7,757	25.8
TOTAL	7	31,079	22.5

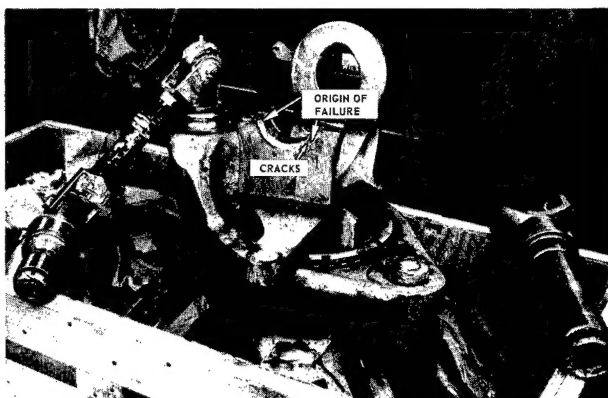
TABLE 3
Approximate CH-37 Mishap Costs

FY	W/W LESS RVN	RVN	TOTAL
1965	\$ 942,900	\$ 5,000	\$ 947,900
1966	0	15,100	15,100
1967	1,843,200	0	1,843,200
TOTAL	\$2,786,100	\$20,100	\$2,806,200

TABLE 4
CH-37 Occupant Injuries

FY	Acfts		Occupants				
			Injury Classification			Total on Board	
			Fatal	Nonfatal	None	Survivable Accidents	Non-survivable Accidents
1965	3	1	4	0	16	16	4
1966	1	0	0	1	4	5	0
1967	1	1	3	3	5	8	3
Total	5	2	7	4	25	29	7

S-Survivable
NS-Non-survivable



H798 Rotor assembly and transmission separated from CH-37B due to fatigue failure of rotor head spindle and lack of quality control.

020903 Improper pilot technique in applying power.



throttle was applied. Descent continued to increase and rpm was lost. Full overhead throttles were applied, but with little effect. A right turn was made for a go-around to gain airspeed and rpm. As aircraft passed over helipad, tail rotor blades struck right corner of pad. Aircraft passed through security fence, coming to rest about 150 feet down a steep slope between two buildings and burned. One occupant had major injuries and two had minor injuries. Caused by improper technique in power application.

Selected Incident Briefs

011801—Left main gear hit top of rice paddy dike after takeoff, damaging gear.

062405—Aircraft struck wires during approach to river bed, damaging main and tail rotor blades.

Selected Forced Landing Briefs

G579—No. 2 engine backfired, lost oil, and smoked. Aircraft could not maintain altitude with single engine power. Cause not reported.

G998—No. 1 engine failed. Caused by failure of No. 12 cylinder rocker arm.

Selected Precautionary Landing Briefs

F469—Loud noise was heard and aircraft yawed left at 1,000 feet during ferry flight. Suspect ASE malfunction.

G162—Transmission oil pressure dropped. Caused by clogged oil passages, due to corrosion preventive and sealing coating flaking off and contaminating oil.

G277—Aircraft was in cruise flight in instrument weather when No. 3 tail rotor drive hanger bearing overheated and started smoking. Aircraft emerged VFR while pilot was calling ATC. Pilot cancelled IFR flight plan and landed. Caused by bearing failure.

G286—Smoke was seen coming from left engine. Caused by oil leaking from push rod cover.

G376—Low pressure warning light came on and first stage servo pressure read zero. Caused by failure of hydraulic pump.

G457—Aircraft vibrated. Caused by three defective hanger bearings.

G773—No. 1 engine lost power and backfired continuously during landing approach. Caused by failure of No. 16 cylinder.

021617—IP reported electrical fire in console. Caused by failure of resistor.

022202—Flight engineer saw sparks flying from No. 1 hanger bearing. Caused by bearing malfunction.

032704—Emergency exit hatch came off. Caused by malfunction of retaining mechanism.

032501—Alternating current circuit failed. Caused by malfunction of No. 2 inverter.

033115—No. 2 engine lost power. Caused by failure of manifold pressure transmitter.

052902—No. 1 engine afterfired and cylinder head temperature rose to 300° C. Suspect intake valve failure, No. 18 cylinder.

060612—IP reported first stage hydraulic failure. Caused by failure of hydraulic hose.

062015—IP reported cyclic control binding. Caused by failure of force gradient spring.

CH-34 MWOs

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-20/1 Change 1	3 Nov 65 8 Mar 66	Improved installation of rotating beacon	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2888 54-2890 thru 54-2907 54-2909 thru 54-2912 54-2914 thru 54-2997 54-2999 thru 54-3007 54-3009 54-3011 thru 54-3021 54-3024 thru 54-3050 55-4462 thru 55-4504 56-4284 56-4286 thru 56-4309 56-4311 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/1 Change 3	7 Mar 62 1 Sep 65	Removal of main rotor droop restrainer torsion spring and antflap restrainer spring	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1725	x		x	
-34/2	28 Jan 64	Removal of rear oil pump check valve spring on R-1820-84A, B, C, and D engines	All aircraft with R-1820-84A, B, C, and D engines		x	x	
-34/3	4 Aug 64	Installation of altitude control purifier chamber	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721	x			x
-34/5	23 Apr 62	Lubrication of pylon disconnect coupling spline	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x		x

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-34/6 Change 2	23 Jun 64 5 Jun 66	Installation of the clutch diverter valve	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4312 56-4313 thru 56-4342 57-1684 thru 57-1770 58-1721	x		x	
-34/7	24 May 63	Installation of drain lines, forward transmission deck	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/9 Change 1	29 May 62 18 Dec 62	Modification and rein- forcement of cargo door latch	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x		x
-34/10 Change 1	29 Jan 63 29 Jan 63	Modification of mounting plate for control gyro and amplifier box	All aircraft equipped with control gyro and amplifier		x	x	
-34/11 Change 1	18 Jun 62 8 Jan 63	Installation of new type (CF ₃ Br) fire extinguisher	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2680 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x		x
-34/12 Change 4	29 Jan 63 19 Aug 64	Reinforcement of pylon tail rotor gearbox fitting	53-4475 thru 53-4478 53-4480 thru 53-4482 53-4484 thru 53-4489 53-4491 thru 53-4496 53-4498 thru 53-4511 53-4513 thru 53-4515 53-4517 thru 53-4527 53-4529 thru 53-4549 53-4551 thru 53-4554 54-0882 thru 54-0892 54-0894 thru 54-0937 54-2860 thru 54-2881 54-2883 thru 54-2899 54-2901 thru 54-2906	x		x	

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-34/12 Change 4	29 Jan 63 19 Aug 64	Reinforcement of pylon tail rotor gearbox fitting	54-2908 and 54-2909 54-2911 thru 54-2913 54-2995 thru 54-2999 54-3001 thru 54-3021 54-3023 thru 54-3033 54-3035 thru 54-3050 55-4462 thru 55-4466 55-4468 thru 55-4473 55-4476 55-4479 thru 55-4504 56-4284 thru 56-4301 56-4303 thru 56-4322 56-4324 thru 56-4325 56-4327 56-4329 thru 56-4340 56-4342 57-1684 thru 57-1770 58-1721	x		x	
-34/13 Change 1	19 Jul 63 5 Oct 63	Installation of observa- tion door and window in cabin floor	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504	x		x	
-34/14	5 Jul 63	Replacement of all aluminum pulleys and inspection of control cable for chafing in the tail rotor system	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/16	11 Jan 64	Installation of engine magnetic chip detectors and cockpit warning light	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/17 Change 2	11 Mar 63 19 Aug 64	Rework of fuselage structure—aft trans- mission support fittings	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-34/18 Change 1	18 Apr 63 24 Jun 64	Inspection and rework of tail rotor gearbox input housing	All aircraft except those that have the following tail rotor gearboxes installed which have been modified by the contractor St 58-2036, St 58-2132, St 58-2148, St 58-2149, St 58-2165, St 58-2169, St 58-2179, St 58-2181, St 58-2191, St 58-2193, St 58-2199, St 58-2200, St 58-2201, St 58-2202, St 58-2203, St 58-2204, St 58-2205, St 58-2208, St 58-2214, St 58-2215, St 58-2219 and subsequent		x	x	
Change 1 -34/20	1 Apr 63 15 Jul 63	Replacement of T-clips and addition of rein- forcing straps to fuselage and tail cone station 316	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2005 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/21	28 May 63	Replacement of aluminum with phenolic engine control cable pulleys	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/23	15 Oct 63	Inspection and modifi- cation of throttle control pulley bracket installa- tion	56-4316 thru 56-4342 57-1684 thru 57-1770 58-1721 and all aircraft which have complied with TM 1-1H-34A-573, 5 Feb 59		x	x	
Change 1 -34/25	23 Apr 64 8 Mar 66	Installation of rotor brake and clutch interlock	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050	x		x	

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-34/27 Change 1	5 Aug 66 9 Jan 67	Modification of cockpit sliding window (S1620- 65223-9 and S1620- 65223-10)	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721	x		x	
-34/30	26 Mar 65	Modification of automatic and manual cargo release systems	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/31	14 Nov 66	Modification of demount- able power package control installation	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/32 Change 1	30 Aug 65 26 Jul 66	Installation of electric chip detector system for the main transmission	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/33	10 Nov 66	Installation of fuse in fuel quantity indicating circuit	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-34/34 Change 1	17 Jun 65 14 Jan 66	Installation of emergency escape axes	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4315 56-4317 thru 56-4319 56-4321 thru 56-4342 57-1685 thru 57-1704 57-1706 thru 57-1723 57-1727 thru 57-1770 58-1721	x		x	

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-34/35 Change 1	23 Jun 65 26 Jan 66	Inspection and/or modification of horn lock assembly (S1610-23061-2)	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x	x	
-40/1	27 Jan 67	Inspection and modifica- tion of engine cooling fan assemblies (S1635- 91075 and S1635-91102 series)	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721	x		x	
55-1680-200-20/1 Change 2	7 Jun 65 6 Jun 66	Modification of safety lap belts (54H19650) type MD-1 and (54H19651) type MD-2 incorporate spring, lap belt webbing retarder (62B4407)	All MD-1 and MD-2 safety lap belts		x		x
55-2800-201-20/1 Change 1	10 Feb 64 28 Aug 64	Incorporation of new oil strainer assembly on engine models R-1300-3, -3A, -3B, -3C, and -3D; R-1820-84A, -84B, -84C, -84D, -103, and -103A	All aircraft		x	x	
11-5821-244-30/2 Change 1	17 Aug 66 1 Mar 67	Modification of radio set AN/ARC-54 to provide (X) mode operation	All AN/ARC-54 with RT-348 by Collins Radio Co. S/N 1 thru 3676 with transmit- audio module S/N's ending in A thru L on P/O 20866-PP-63, FR28-043-P6-00099E and FR28-043-P6- 0063E. S/N 3677 thru 3923 on P/O FR28-043-P5-00690E transmit-audio modules with S/N's ending in M and N require only partial modification. Modules with S/N's ending in O, P, Q, and up require no modifi- cation.				

CH-34 TBs

TB No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-202-20/4	2 Jun 67	Inspection of tail rotor blades (S1615-30100-2 and S1615-30100-4)	53-4475 thru 53-4554 54-0882 thru 54-0937 54-2860 thru 54-2914 54-2995 thru 54-3050 55-4462 thru 55-4504 56-4284 thru 56-4342 57-1684 thru 57-1770 58-1721		x		x
-30/1	14 Apr 65	Inspection of pylon hinge bolts	All CH-34 aircraft 53-4475 thru 58-1721		x		x
-34/2	12 Mar 63	Inspection of main rotor horn lock assembly	N/A		x	x	
-34/3	10 Jan 64	Inspection of main rotor servo control arms	All CH-34 series which have sheet metal S1665-20050 main rotor servo control arms installed		x		x

CH-37 MWOs

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-203-20/4	10 May 67	Modification of interphone wiring	54-0993 thru 54-1000 55-0610 thru 55-0650 57-1642 thru 57-1661 58-0083 thru 58-1006		x	x	
-34/1	24 Oct 61	Main rotor service platform installation	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-988	x			x
-34/3	24 Mar 64	Main rotor service platform installation	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x		x
-34/4 Change 2	16 Mar 62 12 Apr 63	Modification of tail rotor drive shaft forward couplings and shaft, brake, and pulley assembly	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006	x			x

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-203-34/5 Change 1	14 Jan 63 25 Oct 63	Modification of engine oil cooling system-air ducting	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x	x	
-34/7	11 Jul 63	Installation of modified oil tank dip stick	54-994 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-640 55-642 55-647 thru 55-650 57-1644 and 57-1645 57-1648 and 57-1651 57-1654 and 57-1655		x	x	
-34/8 Change 1	23 Feb 63 29 Sep 64	Incorporation of cargo hoist guillotine	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006	x		x	
-34/12 Change 1	16 May 63 22 Sep 64	Addition of magnetic chip detectors in engines and main transmission	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x	x	
-34/14 Change 1	15 Apr 63 11 Dec 63	Structural modification of pylon assembly	55-641, 57-1646, 57-1650, 57-1652, 57-1653, 57-1658, 57-1660, 58-983, 58-984, 58-987, 58-989, 58-990, 58-991, 58-992, 58-993, 58-999, 58-1002, 58-1004, 54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-640 55-642 thru 55-650 57-1642 thru 57-1645 57-1647 thru 57-1649 57-1651 57-1654 thru 57-1657 57-1659 57-1661 and 58-988 58-994 thru 58-998 58-1000, 58-1001, 58-1003, 58-1005, and 58-1006	x		x	

MWO No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-203-34/16	25 Jun 64	Reinforcement of tail rotor pylon structure	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x	x	
-34/19	19 Aug 64	Modification of cargo sling release mechanism	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x	x	
-40/1	5 Oct 65	Installation of provisions for high frequency radio set AN/ARC-102	On aircraft as required by tactical operations or tactical training	x		x	
-40/3	19 Apr 67	Inspection and modification of main landing gear	54-0993 thru 54-1000 55-0610 thru 55-0613 55-0615 thru 55-0632 55-0635 thru 55-0639 55-0641 thru 55-0650 57-1642 thru 57-1661 58-0983 thru 58-0992 58-0994 58-0996 thru 58-1006		x	x	
55-1680-200-20/1 Change 2	7 Jun 65 6 Jun 66	Modification of safety lap belts (54H19650) type MD-1 and (54H19651) type MD-2 incorporate spring, lap belt webbing retarder (62B4407)	All MD-1 and MD-2 safety lap belts		x		x
55-2925-200-30/1	7 May 63	Incorporation of new improved capacitor bracket (1531103) on generator (30E20-5B)	All aircraft with 30E20-5B generators		x	x	
11-5821-244-30/2 Change 1	17 Aug 66 1 Mar 67	Modification of radio set AN/ARC-54 to provide (X) mode operation	All AN/ARC-54 with RT-348 by Collins Radio Co. S/N 1 thru 3676 with transmit-audio module S/N's ending in A thru L on P/O 20866-PP-63, FR28-043-P6-00099E and FR28-043-P6-00634E. S/N 3677 thru 3923 on P/O FR28-043-P5-00690E transmit-audio modules with S/N's ending in M and N require only partial modification. Modules with S/N's ending in O, P, Q, and up require no modification		x		x

CH-37 TBs

TB No.	Date	Title	Aircraft or Comp Affected	Wt & Bal Change		Record on 2408-5	
				Yes	No	Yes	No
55-1520-203-20/1	28 Dec 66	Inspection of main rotor head	54-994 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-640 55-642 thru 55-645 55-647 thru 55-650 57-1644 thru 57-1645 57-1648, 57-1651, 57-1654 thru 57-1661 58-983 thru 58-993 58-995 thru 58-1006		x		x
-30/2	5 Jul 68	Inspection of main rotor damper assembly	54-993 thru 54-1000 55-610 thru 55-613 55-615 thru 55-632 55-635 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x		x
-34/1	2 Nov 64	Inspection of front wing beam	All CH-37B having accrued 1,200 or more hours total time. All other aircraft will be inspected upon accruing 1,200 hours total time.		x		x
-34/2	23 Nov 64	Inspection of fuel system for contamination	54-994 thru 54-1000 55-610 thru 55-613 55-615 thru 55-639 55-641 thru 55-650 57-1642 thru 57-1661 58-983 thru 58-1006		x		x

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